

PATENT SPECIFICATION

(11) 1 560 753

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- (21) Application No. 10072/76 (22) Filed 12 March 1976
 (23) Complete Specification filed 8 March 1977
 (44) Complete Specification published 6 Feb. 1980
 (51) INT CL³ B01F 3/04; C02D 1/04
 (52) Index at acceptance B1C B2B
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(54) AN IMPROVEMENT IN OR RELATING TO CARBONATORS

(71) We, **BRITISH SYPHON INDUSTRIES LIMITED**, a British Company, of Netherthorpe Road, Sheffield, 3, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to carbonators, that is to say to apparatus for carbonating water for use, inter alia, in the mixing of soft drinks, and has for its object, to provide an improvement therein.

According to the present invention there is provided in combination, a carbonator and a cooler arrangement provided with or connected to a refrigeration unit, the carbonator being constituted by a container provided within it with a coil through which chilled or iced water or other refrigerant can be circulated to chill the carbonated water in the carbonator, the coil of the carbonator either being supplied with chilled or iced water from the cooler arrangement or supplied with refrigerant from the refrigeration unit. A baffle disc will preferably be provided within the container of the carbonator to provide restricted communication between spaces above and below it, at least a part of the coil through which chilled or iced water or other refrigerant is to be circulated being located beneath said baffle plate, and a pipe which is provided for drawing off the carbonated water from the carbonator communicating with the space beneath the baffle plate. The container of the carbonator will preferably be "lagged" with a heat insulating material.

In order that the invention may be fully understood and readily carried into effect, the same will not be described, by way of example only, with reference to the accompanying drawings, of which:—

Fig. 1 is a diagrammatic illustration of a carbonator embodying the invention, and Fig. 2 is a further diagrammatic illustration showing how such a carbonator can be used in conjunction with apparatus

for the dispensing of soft drinks.

Referring now to Fig. 1 of the drawings, the carbonator there illustrated includes a closed container 10 through the top of which is connected a spray nozzle 12 for the supply of fresh water from a supply pipe 14. A level sensor 16 is provided to control the opening and closing of a valve (not shown) for controlling the flow of fresh water to the nozzle 12 so that the water within the container is maintained at a required level. A safety valve 18 is also provided to guard against excess pressure within the container. A supply pipe 80 is provided for the injection of carbon dioxide gas (from a source not shown) into the container. A pipe 22 is provided for the drawing off of carbonated water as and when required.

The carbonator is provided within it with a cooling coil, generally indicated 24, through which chilled or iced water can be circulated to chill the carbonated water, supply and return pipes 26 and 28 being connected to the coil through the top of the container. A baffle disc 25 is provided near the bottom of the container as shown, the disc being tilted up at one side to provide restricted communication between the spaces above and below it. The cooling coil extends through holes in the baffle disc and is provided with two turns above the disc and one turn below it. The pipe 22 extends through a hole in the baffle disc to draw water from the space below the disc which is of relatively small volume. The arrangement is such that, even in a sudden spate of use, carbonated water which is drawn off through the pipe 22 is water in the required chilled condition regardless of the fact that warmer water has been admitted to the carbonator and has reduced the chill of the water in the uppermost part of the container. The container is "lagged" with a heat insulating material (not shown).

It is found that there is a relatively high heat transfer coefficient between the carbonated water in the carbonator and the chilled or iced water in the coil by virtue of

the fact that both the interior and exterior surfaces of the coil are in contact with water and because of the movement of the water. Also, since the side walls of the container are plain it is easy to "lag", that is to say, it can be "lagged" much more easily than if it was surrounded by a cooling coil.

In Fig. 2 there is illustrated apparatus for the dispensing of soft drinks. The apparatus includes a carbonator generally indicated 30 and identical to that described above. The apparatus also includes a cooler arrangement generally indicated 32 and beverage dispense apparatus generally indicated 34.

The cooler arrangement is constituted by a water tank 36 from which the supply and return pipes 26 and 28 of the carbonator cooling coil extend for the circulation of chilled water through said coil by a pump 38 driven by a motor 40. A refrigeration unit 42 is located adjacent the water tank 36 and the evaporator coil 44 of said unit extends into the water in the tank 36. An agitator 46 also extends into the water in said tank and is driven by a motor 48.

The fresh water supply pipe 14 to the carbonator is shown to extend through the water in the tank 36 in the form of a coil generally indicated 50 and is connected to a motor driven pump 52 (which as indicated by the chain-dotted line is under the control of the level sensor 16 of the carbonator). A spare coil 51 is shown to be disposed in the tank 36 and it will be understood that this may be used to cool the supply of water to another carbonator, or if the apparatus is installed on licensed premises, it may be used to cool the supply of beer to a beer dispense tap so that the beer is dispensed in a chilled condition as claimed in prior Application for Patent No. 21622 of 1974 Serial No. 1,464,125 or may be used for cooling a storage space as described in our pending Application for Patent No. 54376 of 1976 (Serial No. 1,558,679). Alternatively, it may be used to cool a bottle shelf.

The beverage dispense apparatus 34 is shown in Fig. 2 to be constituted by a valve or tap 54 which can be opened to cause chilled carbonated water from the pipe 22 to be mixed with syrup from a container 56, the contents of the container 56 being maintained under pressure by means of a cylinder 58 of carbon dioxide and the contents of the carbonator being maintained under pressure by the pressure of carbon dioxide admitted to it from the pipe 20. (Means not shown are provided of course for regulating the flow of syrup

relative to the flow of carbonated water so that a mixed beverage of the required proportions is dispensed from the nozzle of the valve or tap 54). Alternatively the syrup may be delivered and controlled by means of a pump and carbonated water flow detector as described in our pending Application for Patent No. 48013 of 1973 (Serial No. 1,475,679) (and cognate No. 32391 of 1974).

A carbonator as described above is especially useful in that it can be used in combination with the kind of cooler arrangement indicated at 32 in Fig. 2, that is to say the kind of central cooler arrangement on licensed premises for the cooling of beer.

Various modifications may be made without departing from the scope of the invention, and it will be understood that instead of chilled or iced water being circulated through the coil in the carbonator a liquid other than water could be used or a refrigerant directly from a refrigeration apparatus such as 42.

WHAT WE CLAIM IS:—

1. In combination, a carbonator and a cooler arrangement provided with or connected to a refrigeration unit, the carbonator being constituted by a container provided within it with a coil through which chilled or iced water or other refrigerant can be circulated to chill the carbonated water in the carbonator, the coil of the carbonator either being supplied with chilled or iced water from the cooler arrangement or supplied with refrigerant from the refrigeration unit.

2. The combination according to claim 1, in which a baffle disc is provided within the container of the carbonator to provide restricted communication between spaces above and below it, at least a part of the coil through which chilled or iced water or other refrigerant is to be circulated being located beneath said baffle plate, and a pipe which is provided for drawing off the carbonated water from the carbonator communicating with the space beneath the baffle plate.

3. The combination according to either one of the preceding claims, in which the container of the carbonator is "lagged" with a heat insulating material.

4. In combination, a carbonator and a cooler arrangement substantially as hereinbefore described with reference to and as illustrated by Fig. 2 of the accompanying drawings.

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Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1980.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from
which copies may be obtained.

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COMPLETE SPECIFICATION

2 SHEETS

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Sheet 1

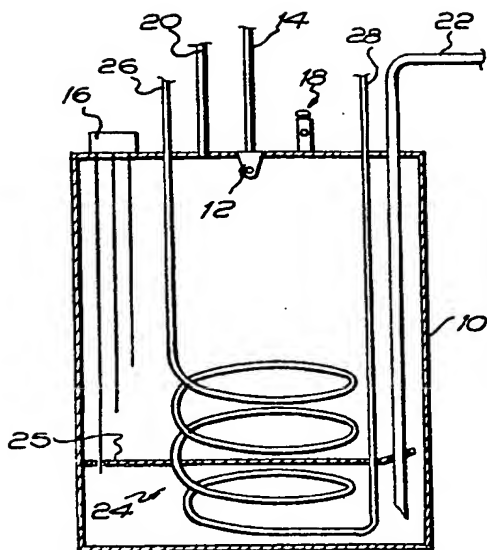


FIG. 1

COMPLETE SPECIFICATION

*This drawing is a reproduction of
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Sheet 2*

